Analysis Issues with Version 5.0 of the National Fire Incident Reporting System (NFIRS 5.0)

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Overview

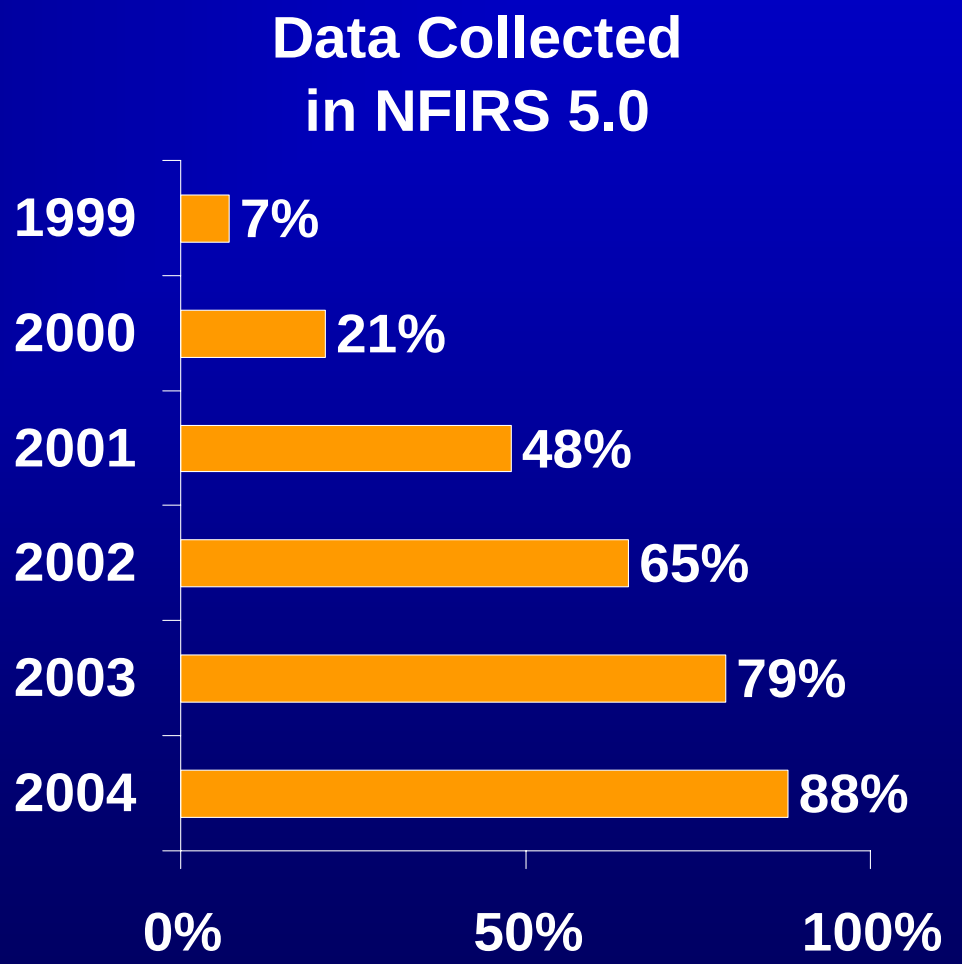
- Calculating national estimates
- History of NFIRS 5.0
- Changes in data definitions and rules
  - Confined fires
  - Automatic detection and suppression
  - Equipment involved in ignition
  - Heat source
  - Arson
  - Handling unknown data

National Estimates

- NFIRS provides details
  - Voluntary at federal level
  - Reporting requirement vary by state
  - Not a statistical sample
- NFPA's fire department survey is a statistical sample of summary data
- NFIRS percentages are used with NFPA projections

History of NFIRS 5.0

- Earlier versions used codes from 1976
- Fire service wanted easier system
- First introduced in 1999
  - Vendors and USFA software
- Big departments were later



Changes in Data Definitions and Rules

- More detail on incident types and equipment involved
- Fewer property use codes
- Detection and suppression equipment in terms of fire area
  - May not be the same as area of origin
  - More fields
- Multiple entry fields:
  - Factors contributing, actions taken

Wording Changes Matter

- Example: area of origin code 23
  - Formerly: “dining area, lunchroom or cafeteria”
  - In NFIRS 5.0: “bar area, beverage, service area, cafeteria, canteen area, dining room, lunch area”
  - Does not pick up same fires
- Pull-down menus have shorter definitions

Converted Data

- Data collected by old system is converted to NFIRS 5.0
  - Definitions are not identical
  - Some code choices did not exist
  - Cannot convert from less detail to more
- May choose to exclude older version
  - Field for NFIRS version

What's a Structure Fire?

- Incident types
  - 110s Structure fires
  - 120s Fires in mobile property used as fixed structures
- The 110 series includes
  - 111 Building fire
  - 112 Fire in structure other than a building
  - 113-118 Confined structure fires

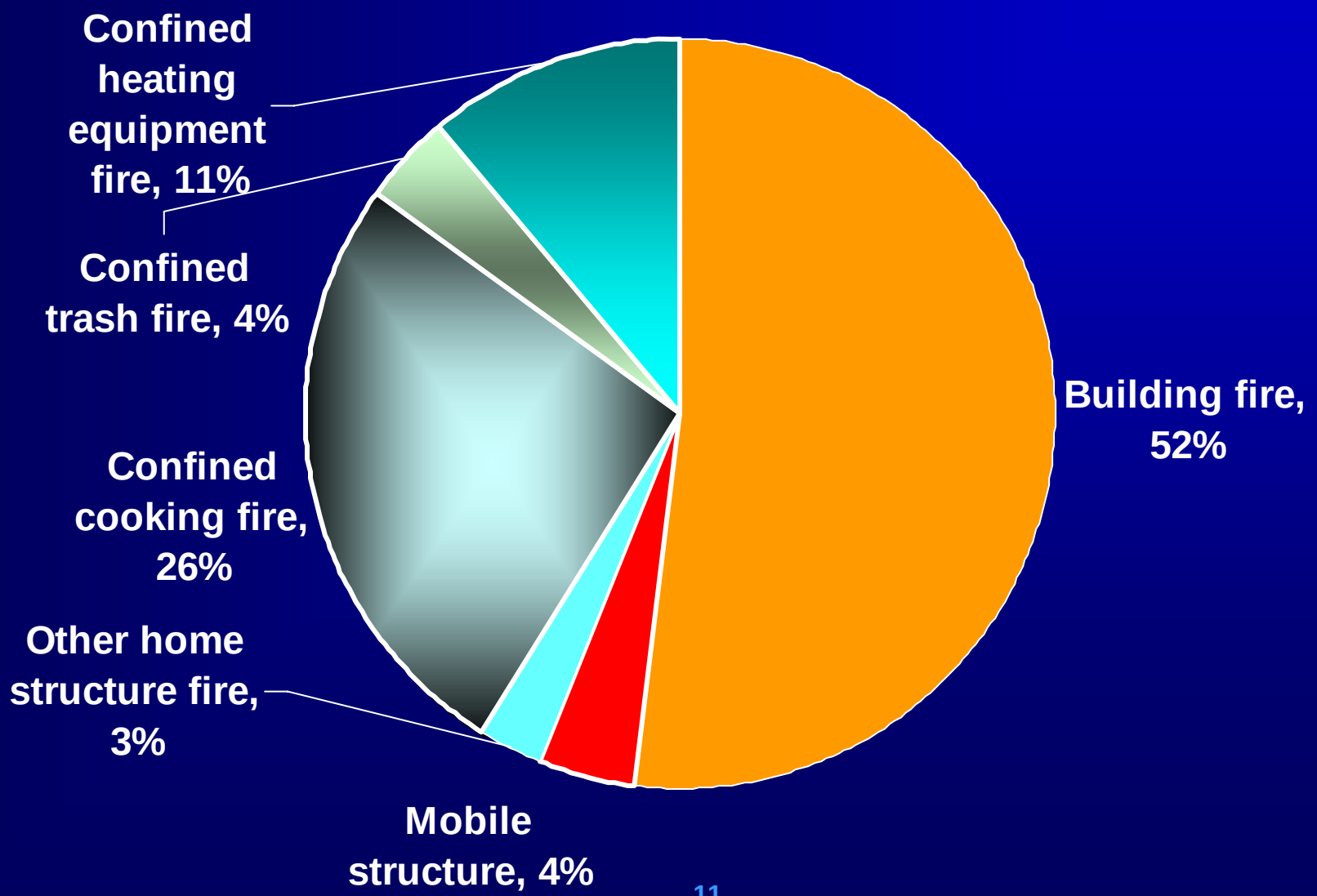
Confined Structure Fires

- Six confined structure incident types
  - Cooking
  - Chimney or flue
  - Incinerator
  - Fuel burner or boiler
  - Commercial compactor
  - Trash or rubbish
- May have been called smoke scares in past

More on Confined Fires

- Causal and suppression data not required
- Only required question on detection:
  - Did detector alert occupants?
- Pool of incidents with required data tilts toward more serious fires

2000-2004 Home Structure Fires in NFIRS 5.0: 41% Were Confined

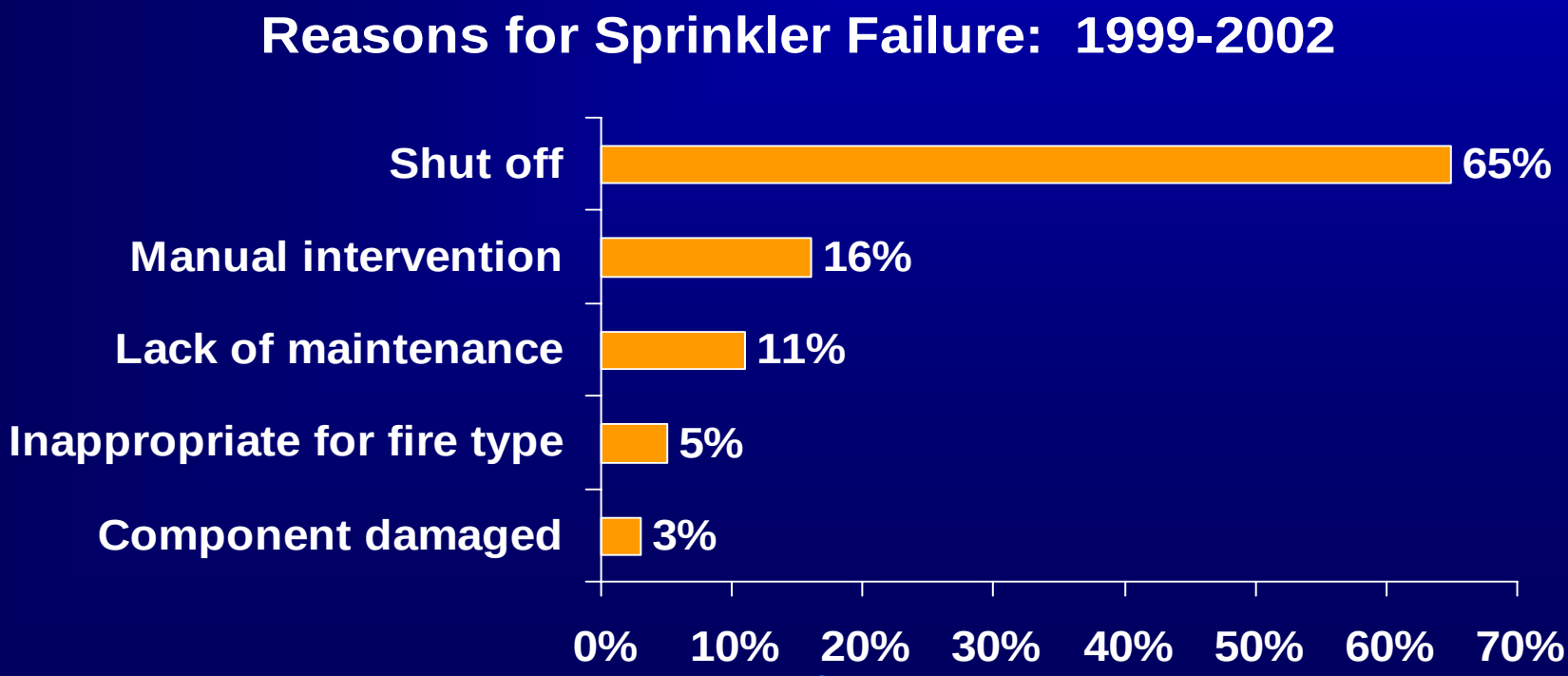


Home Smoke Alarm Status 2000-2004 NFIRS 5.0 Data

Status	Fires	Deaths	Rate
Smoke alarm operated in non-confined fire	23%	34%	1.2
Smoke alarm alerted occupants in conf fire	26%	0%	0.0
Subtotal – Operating	49%	34%	0.6
Failed in non-conf fire	7%	22%	2.5
None in non-conf fire	24%	43%	1.4
Did not alert in conf fire	15%	0%	0.0
Subtotal - No operating	46%	65%	1.1

Sprinkler Reliability

- Can now screen out fires with equipment not in fire area
- When the fire was large enough, only 7% of sprinklers failed to operate



Equipment Involved in Ignition

- Expanded to 3-digit codes
- Definition changed from
  - Equipment that provided the heat, to
  - Equipment that provided the heat if it malfunctioned or was used improperly

    Changed back in 2006
- No longer a mandatory field
- Most home heating and cooking fires are confined

Smoking Materials, Candles and Other Heat Source Codes

- Old versions had separate ranges for smoking materials and open flame
- Code 60 – “Heat from open flame or smoking material, other”
  - Accounted for 6% of home fire deaths with known heat source
  - NFPA allocates code 60 across open flame and smoking materials (codes 61-69)

Arson

- Formerly, “incendiary” and “suspicious” were usually combined
- NFIRS 5.0 has “intentional”
  - Suspicious has been dropped
- Cause not required for confined trash or outdoor rubbish fires

Defining and Handling Unknown and Missing Data

- NFPA usually allocates unknown data proportionally
  - Assumes unknowns would be like known
  - “Not required” is not the same
- Some coded data actually unknown
  - Factor contributing to ignition “none”
  - “No equipment involved” with contradictory causal factors

Skip Patterns & Unknowns

- Some data elements are not required for some fires
- Type of material first ignited is not required for
  - Organic materials, e.g., food or vegetation
  - General materials, e.g., wiring insulation, dust, residue, etc.
- Material contributing to flame spread
  - Check box if no flame spread, item unknown, or same as item ignited

Pluses and Minuses of Using NFIRS 5.0 Data Only

- Consistent definitions and data collection rules
  - No converted data
- Greater detail on automatic detection and suppression, equipment involved
- Greater consistency with future data
- Smaller set of fires, particularly fatal fires

Challenges to NFIRS 5.0 Analysis

- Changes in definitions and coding rules make trend analysis questionable
- Harder to identify and handle unknown data
- Non-confined fire pool will be more serious than structure fires in past
  - Measures of average severity will increase unless confined fires are included

For More Information

- NFIRS info

  http://www.nfirs.fema.gov/

- My contact info

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